

# LESSON OVERVIEW

In this lesson students will investigate what happens to household waste and recyclables after it has been collected. The lesson will focus on the waste pyramid (hierarchy) of avoidance, reuse, recycle and disposal. Students will use the game **Waste Sort** to learn about the importance of preparing waste and resources, sorting it properly to avoid contamination at the waste management centres. Students will complete a scientific investigation on how landfills work and the negative impact that our waste can have on the natural environment.



## LEARNING INTENTION



### STUDENTS WILL:

- Learn about the waste pyramid (hierarchy) of avoidance, reuse, recycle and disposal.
- Understand what happens to our garden organics (green) after it has been collected.
- Understand what happens to our recyclable (yellow) resources after it has been collected.
- Understand what happens to our general (red) waste after it has been collected.
- Conduct a scientific investigation on how landfills work and explore the negative impacts that our waste has on the natural environment.

## RESOURCES



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| <ul style="list-style-type: none"> <li>• <b>Waste Sort</b> game</li> <li>• Interactive whiteboard</li> <li>• Examples of organic, recyclable and general waste</li> <li>• Large plastic bottles or jars</li> <li>• Gloves</li> <li>• Soil</li> <li>• Gravel</li> <li>• Scraps of general waste (you can use</li> </ul> | <ul style="list-style-type: none"> <li>• waste that students might throw out at recess (e.g. lunch)</li> <li>• <a href="http://camden.nsw.gov.au/environment/waste-environment/">http://camden.nsw.gov.au/environment/waste-environment/</a></li> <li>• <a href="http://www.campbelltown.nsw.gov.au/RSF/ServicesandFacilities/WasteandRecycling">http://www.campbelltown.nsw.gov.au/RSF/ServicesandFacilities/WasteandRecycling</a></li> <li>• <a href="http://wollondilly.nsw.gov.au/resident-services/waste/">http://wollondilly.nsw.gov.au/resident-services/waste/</a></li> <li>• <a href="http://www.epa.nsw.gov.au/wastestrategy/waste-hierarchy.htm">http://www.epa.nsw.gov.au/wastestrategy/waste-hierarchy.htm</a></li> </ul> |
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# ASSESSMENT

A rubric has been provided to track and evaluate student understanding. The learning outcomes will be assessed throughout the lesson using discussion, questioning, reflection and a scientific investigation.



## AUSTRALIAN CURRICULUM LINKS

### KEY LEARNING AREA:

#### GEOGRAPHY

The role of local government and the decisions it makes on behalf of the community (ACHASSK091)

#### HEALTH AND PHYSICAL EDUCATION

Identify and practise strategies to promote health, safety and wellbeing (ACPPS036)

Describe strategies to make the classroom and playground healthy, safe and active spaces (ACPPS040)

#### SCIENCE AND TECHNOLOGY

Living things depend on each other and the environment to survive (ACSSU073)

Natural and processed materials have a range of physical properties that can influence their use (ACSSU074)

Earth's surface changes over time as a result of natural processes and human activity (ACSSU075)

Science involves making predictions and describing patterns and relationships (ACSHE061)

Science knowledge helps people to understand the effect of their actions (ACSHE062)

With guidance, plan and conduct scientific investigations to find answers to questions, considering the safe use of appropriate materials and equipment (ACSIS065)

Compare results with predictions, suggesting possible reasons for findings (ACSIS216)

#### MATHEMATICS

Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values (ACMSP096)

#### ENGLISH

Incorporate new vocabulary from a range of sources into students' own texts including vocabulary encountered in research (ACELA1498)

Use interaction skills such as acknowledging another's point of view and linking students' response to the topic, using familiar and new vocabulary and a range of vocal effects such as tone, pace, pitch and volume to speak clearly and coherently (ACELY1688)

#### DIGITAL TECHNOLOGIES

Recognise the role of people in design and technologies occupations and explore factors, including sustainability that impact on the design of products, services and environments to meet community needs (ACTDEK010)

#### CROSS-CURRICULUM PRIORITIES

Sustainability

#### GENERAL CAPABILITIES

Literacy  
Numeracy  
Personal and social capability  
Critical and creative thinking  
Ethical Understanding



# 21ST CENTURY LEARNING SKILLS

## CRITICAL THINKING



Students are encouraged to think critically about the processes in place to dispose of various types of waste as well as the possible impacts they have on the natural environment.

## COMMUNICATION



Students are encouraged to actively engage in discussions throughout the lesson which will provide opportunity for questioning and sharing of experiences.

## COLLABORATION



Students are required to work collaboratively in groups to investigate how landfill affects the natural environment. The scientific investigation allows opportunities for students to share in their skills and expertise while working in a group setting.

## CREATIVITY



Students are asked to come up with new approaches to how they dispose of waste at home. They are given an opportunity to brainstorm ideas in the classroom and put into practise during their homework task.

## VOCABULARY

Waste  
dispose  
recyclable  
organic  
general  
waste

contaminants

waste management centre

products

landfill

leachate

prevent

environment

reduce

impact



# LESSON INTRODUCTION

- 1 Ask students if they have heard of the waste pyramid. Explain that we have a great responsibility to look after our environment. We have opportunities every day to make choices in how we dispose of our household waste that could greatly impact the natural environment in both a positive and negative way.
- 2 Show students an image of the waste pyramid on the interactive whiteboard. Discuss each section and ask students where they think they might sit on the pyramid. Give students an opportunity to share examples of how they could stay on avoidance, reuse and recycle.
- 3 Discuss why students think disposal is at the bottom of the pyramid.
  - *Why is it the least desirable method of waste disposal?*
  - *Why do you think so many people still sit on that level even though they know it has a harmful impact on the environment?*
- 3 Use your local council's website (Camden, Campbelltown or Wollondilly) to understand what happens to each type of material after it has been collected.
- 4 **What happens to our garden organics (green)?** Show students the examples of the raw and processed organics. Explain that our garden organics (green) is collected and turned into compost and soil conditioners.
- 5 **What happens to our recyclable (yellow) resources?** Show students the example of the recyclable materials. Explain that recyclable material is taken to a material recovery facility (MRF). The material is put onto large conveyor belts where workers have to remove contaminants by hand. This is a lot of work and some contaminants may be missed, contaminants could damage the equipment in the plant, present serious OHS risks as well as reduce the quality of the end product. Once sorted and graded items are sent to other facilities for further processing into products such as cardboard boxes, glass bottles and jars and new plastic products. We can help make this process be more efficient and ensure items don't end up in landfill by following the advice on the Council's website such as emptying containers of leftover food and liquid before we put them in recycling bins. This wouldn't take much effort on our part and it can have a big impact in reducing harm to our environment.

# MAIN BODY OF TEACHING

30 mins

- 1 Pose the questions "Why do we separate recyclable resources from waste?" and "Where does all of our waste go after it has been collected?" Brainstorm with students, recording ideas on the board.
- 2 Play the game Waste Sort and discuss why students think it's important to keep different types of materials separated.
- 6 **What happens to our general (red) waste?** Show students the example of the general waste. Explain that general waste is the waste that we can't reuse or recycle at this time, this waste is disposed of in landfills. Landfills are large areas where waste is buried. A modern engineered landfill is designed to protect the soil and groundwater and capture methane gas emissions. Compacted clay lines the bottom and sides of the landfill along with a thick plastic liner to protect the land from harmful leaks. Pipes collect the liquid waste (leachate) so that it can be treated.

# PLENARY

10 mins

- Garbage is compacted into layers in the landfill each day; a layer of soil is rolled out over the top to reduce odour and control vermin. The main purpose of a landfill is to ensure that the waste is isolated and prevented from harming the surrounding environment. Once a landfill is full, waste is monitored and the land can be repurposed or built on.
- 7 Ask students to think, pair, share using the following questions "What method of disposal do you use the most at home? Can you come up with a strategy to reduce the amount of waste you throw away?"
  - 8 Conduct a scientific experiment to see how landfills work and understand the negative impact our waste can have on the environment. Students work in small groups to construct a simple model of a landfill.
    - *Predict what changes they think will happen over 2 weeks.*
    - *Hand out gloves and talk about the importance of safety and hygiene while handling soil and garbage*
    - *Take a tall plastic bottle or jar, fill ¼ of the container with soil to represent the natural environment.*
    - *Fill 2/4 of the container with scraps of garbage including plastics and paper.*
    - *Fill the remaining ¼ of the container with soil.*
    - *Ensure that all students wash their hands thoroughly.*
    - *Place in a sunny spot in your school and add a small amount of water to the top each day.*
    - *Record observations each day and monitor any changes that occur over 2 weeks.*

- 1 Bring the containers back into the classroom. Discuss what changes have occurred.
  - *What has happened to the garbage?*
  - *What does the soil near the garbage look like?*
  - *Does it smell?*
- 2 Reinforce the message that we want to avoid putting waste into landfill in order to reduce the impact on our environment. Even though modern landfills have taken some measures to reduce their impact we are putting things into the ground that don't belong.
- 3 Revise the waste pyramid with students and reinforce the importance that little choices we make every day have the potential to reduce the harmful effects our waste has on the natural environment.

## HOMEWORK ACTIVITY

Challenge family members to a game of **Waste Sort!** Who can get the highest score?

Go grocery shopping with your family. Have a look at what you normally put in your cart, are the products reusable or recyclable? Are there any products that will end up in landfill? See if you can complete your grocery shopping without buying any products that could end up in landfill. Remember to use the waste pyramid with a focus on avoidance.



# ASSESSMENT RUBRIC – WASTE SORT LESSON

Student understanding of the waste pyramid (hierarchy).

- 4 Student demonstrates an exceptional understanding of all levels of the waste pyramid consisting of avoidance, reuse, recycle and disposal.
- 3 Student demonstrates a strong understanding of all levels of the waste pyramid consisting of avoidance, reuse, recycle and disposal.
- 2 Student demonstrates a satisfactory understanding of the waste pyramid consisting of avoidance, reuse, recycle and disposal.
- 1 Student demonstrates a basic understand of some of the levels of the waste pyramid.

Student understanding of what happens after waste and resources are collected.

- 4 Student demonstrates an exceptional understanding of how general (red), recyclable (yellow) and organic (green) waste and resources are processed.
- 3 Student demonstrates a strong understanding of how general (red), recyclable (yellow) and organic (green) waste and resources are processed.
- 2 Student demonstrates a satisfactory understanding of how general (red), recyclable (yellow) and organic (green) waste and resources are processed.
- 1 Student demonstrates a basic understanding of how some of our waste and resources are processed.

Student's ability to identify ways in which they could reduce the potential harm of waste disposal.

- 4 Student identifies exceptional and relevant strategies they could adopt in order to reduce the potential harm of waste disposal.
- 3 Student identifies effective and relevant strategies they could adopt in order to reduce the potential harm of waste disposal.
- 2 Student identifies some satisfactory strategies they could adopt in order to reduce the potential harm of waste disposal.
- 1 Student identifies some basic strategies they could adopt in order to reduce the potential harm of waste disposal.

# ASSESSMENT RUBRIC – WASTE SORT LESSON

Student engagement in scientific investigation while working in a team.

- 4 Student displays outstanding evidence of teamwork while actively engaging in the scientific investigation.
- 3 Student displays strong evidence of teamwork while actively engaging in the scientific investigation.
- 2 Student demonstrates satisfactory evidence of teamwork while participating in the scientific investigation.
- 1 Student demonstrates basic evidence of teamwork while participating in the scientific investigation.

Student reflection of scientific investigation demonstrates an understanding of why landfill should be a last resort.

- 4 Student shows evidence of thorough reflection using the outcome of their scientific investigation to determine the impacts landfill could have on the environment.
- 3 Student shows evidence of thoughtful reflection using the outcome of their scientific investigation to determine the impacts landfill could have on the environment.
- 2 Student shows evidence of some reflection using the outcome of their scientific investigation to determine the impacts landfill could have on the environment.
- 1 Student shows evidence of basic reflection using the outcome of their scientific investigation to determine the impacts landfill could have on the environment.

